

CLAIMS

1. A multi-speed transmission comprising:
 - an input shaft;
 - an output shaft;
 - a planetary gear arrangement having first, second and third
 - 5 planetary gear sets, each planetary gear set having a ring gear, sun gear and carrier;
 - said input shaft being continuously interconnected with said carrier of the third planetary gear set, said output shaft being continuously interconnected with said ring gear of the first planetary gear set;
 - 10 said ring gear of the second planetary gear set being integrally connected with said ring gear of the first planetary gear set, and said carrier of the second planetary gear set being continuously connected with said carrier of the first planetary gear set;
 - said second planetary gear set being a compound planetary gear
 - 15 set, and said first and third planetary gear sets being simple planetary gear sets;
 - a first clutch selectively interconnecting said ring gear of the third planetary gear set with said sun gear of the second planetary gear set;
 - a second clutch selectively interconnecting said ring gear of the
 - 20 third planetary gear set with said sun gear of the first planetary gear set;
 - a third clutch selectively interconnecting said carrier of the third planetary gear set with said carrier of the first planetary gear set;
 - a fourth clutch selectively interconnecting said carrier of the third planetary gear set with said sun gear of the first planetary gear set;
 - 25 a first brake selectively interconnecting said sun gear of the second planetary gear set with a transmission housing;
 - a second brake selectively interconnecting said carrier of the second planetary gear set with said transmission housing; and

said first, second, third and fourth clutches, and first and second
30 brakes being engaged in combinations of two to establish at least seven
forward speed ratios and a reverse speed ratio between said input shaft and
said output shaft.

2. The multi-speed transmission of claim 1, wherein said first,
second, third and fourth clutches, and first and second brakes are engaged in
combinations of two to establish eight forward speed ratios and a reverse
speed ratio between said input shaft and said output shaft.

3. The multi-speed transmission of claim 1, wherein said ring
gear of the second planetary gear set is integrally connected with said ring
gear of the first planetary gear set by a sleeve, and a spacer is positioned
between said ring gear of the second planetary gear set and said ring gear of
5 the first planetary gear set.

4. The multi-speed transmission of claim 3, wherein said ring
gear of the second planetary gear set and said ring gear of the first planetary
gear set are splined to said sleeve.

5. The multi-speed transmission of claim 4, further comprising a
spring member positioned between said ring gear of the second planetary
gear set and said ring gear of the first planetary gear set.

6. A multi-speed transmission comprising:
an input shaft;
an output shaft;
a planetary gear arrangement having first, second and third
5 planetary gear sets, each planetary gear set having a ring gear, sun gear and
carrier;

said input shaft being continuously interconnected with said carrier of the third planetary gear set, said output shaft being continuously interconnected with said ring gear of the first planetary gear set;

10 wherein said ring gear of the second planetary gear set is integrally connected with said ring gear of the first planetary gear set by a sleeve; a spacer and spring member are positioned between said ring gear of the second planetary gear set and said ring gear of the first planetary gear set; and said ring gear of the second planetary gear set and said ring gear of
15 the first planetary gear set are splined to said sleeve;

 said carrier of the second planetary gear set being continuously connected with said carrier of the first planetary gear set;

 said second planetary gear set being a compound planetary gear set, and said first and third planetary gear sets being simple planetary gear
20 sets;

 a first clutch selectively interconnecting said ring gear of the third planetary gear set with said sun gear of the second planetary gear set;

 a second clutch selectively interconnecting said ring gear of the third planetary gear set with said sun gear of the first planetary gear set;

25 a third clutch selectively interconnecting said carrier of the third planetary gear set with said carrier of the first planetary gear set;

 a fourth clutch selectively interconnecting said carrier of the third planetary gear set with said sun gear of the first planetary gear set;

30 a first brake selectively interconnecting a transmission housing with said sun gear of the second planetary gear set;

 a second brake selectively interconnecting said transmission housing with said carrier of the second planetary gear set; and

 said first, second, third and fourth clutches, and first and second brakes being engaged in combinations of two to establish at least seven
35 forward speed ratios and a reverse speed ratio between said input shaft and said output shaft.

7. A multi-speed transmission comprising:

an input shaft;

an output shaft;

a planetary gear arrangement having first, second and third

5 planetary gear sets, each planetary gear set having a first, second and third members;

said input shaft being continuously interconnected with said second member of the third planetary gear set, said output shaft being continuously interconnected with said first member of the first planetary gear set;

10 said first member of the second planetary gear set being integral with said first member of the first planetary gear set, each said first member being a ring gear;

said second member of the second planetary gear set being continuously connected with said second member of the first planetary gear set;

15 said second planetary gear set being a compound planetary gear set, and said first and third planetary gear sets being simple planetary gear sets;

20 a first clutch selectively interconnecting said first member of the third planetary gear set with said third member of the second planetary gear set;

a second clutch selectively interconnecting said first member of the third planetary gear set with said third member of the first planetary gear set;

25 a third clutch selectively interconnecting said second member of the third planetary gear set with said second member of the first planetary gear set;

a fourth clutch selectively interconnecting said second member of
30 the third planetary gear set with said third member of the first planetary gear
set;

a first brake selectively interconnecting a transmission housing
with said third member of the second planetary gear set;

a second brake selectively interconnecting said transmission
35 housing with said second member of the second planetary gear set; and

said first, second, third and fourth clutches, and first and second
brakes being engaged in combinations of two to establish at least seven
forward speed ratios and a reverse speed ratio between said input shaft and
said output shaft.

8. The multi-speed transmission of claim 7, wherein each said
first member comprises a ring gear, each said second member comprises a
carrier, and each said third member comprises a ring gear.

9. The multi-speed transmission of claim 7, wherein said first,
second, third and fourth clutches, and first and second brakes are engaged in
combinations of two to establish eight forward speed ratios and a reverse
speed ratio between said input shaft and said output shaft.

10. The multi-speed transmission of claim 8, wherein said ring
gear of the second planetary gear set is integrally connected with said ring
gear of the first planetary gear set by a sleeve, and a spacer is positioned
between said ring gear of the second planetary gear set and said ring gear of
5 the first planetary gear set.

11. The multi-speed transmission of claim 10, wherein said ring
gear of the second planetary gear set and said ring gear of the first planetary
gear set are splined to said sleeve.

12. The multi-speed transmission of claim 11, further comprising a spring member positioned between said ring gear of the second planetary gear set and said ring gear of the first planetary gear set.